

ABSTRACT

The invention provides a system and method for microscopic X-ray fluorescence.

An X-ray source, X-ray focusing element and a tapered X-ray opaque focusing aperture

5 provide a focused X-ray spot on a sample. The system translates a sample between an
imaging position and a testing position. In the imaging position, the sample is aligned in
three dimensions and after alignment, the system automatically translates the sample
between the imaging position and the testing position. To avoid collision between the
sample and other elements of the system, a position detecting device terminates the
10 sample translation if the sample trips the position detecting device. The focusing aperture
of the system has a tapered through opening to block unfocused X-rays and reduce or
eliminate a halo effect. To detect low atomic number elements, a detector aperture is
vacuum sealed to an X-ray detector and X-ray elements of the system are vacuum
evacuated.